

CLAIMS

1.- Image acquisition module for monitoring applications of the external surroundings of a vehicle, characterized in that it comprises:

5 - a housing (1) with an interior protected against at least moisture and a window (6) hermetically closed by a transparent element (35);

- a electronic circuit (4) accommodated in said housing (1) and associated with connection means with the exterior, for supply and/or bidirectional signal exchange;

10 - an image detector (5) connected to said electronic circuit (4) and opposed to said window (6);

- a support (7) attached to the housing (1) to carry an optic system (8) between said image detector (5) and said window (6); and

15 - positioning means and releasable fixation means to enable at least the focussing of said optic system (8) and the releasable fixation of the module to an external structure (36) of a vehicle.

2.- Module, according to claim 1, wherein said window (6) is associated with at least one protection device from external agents and from the luminous incidence, guaranteeing an appropriate light pass through said transparent element (35).

20 3.- Module, according to claim 2, wherein said protection device, which is at least one, comprises a visor element (10) disposed around at least a part of said window (6).

4.- Module, according to claim 3, wherein the protection device comprises, furthermore, a car gutter element (27) disposed around at least another part of said window (6).

25 5.- Module, according to claim 1, wherein said window (6) or said support (7) are, furthermore, associated with conditioning means of the light pass conditions through said transparent element (35).

30 6.- Module, according to claim 5, wherein said conditioning means comprise an electric heater device (9) associated with said transparent element (35) and/or with said optical system (8) and being supplied from said connection means with the exterior.

35 7.- Module, according to claim 4, wherein said visor (10) and car gutter elements (27) are integrated around an opening (28) of a mounting adapter (18) of the housing (1), including said adapter (18) focussing means and releasable fixation means for the fixation of said housing (1) in cooperation with said focussing means and said releasable fixation means of the housing (1) guaranteeing a predetermined position of said opening (28) and visor (10) and car gutter elements (27) in relation to

the window (6), and releasable fixation means for the releasable fixation of said mounting adapter (18) to said external structure (36) of a vehicle.

8.- Module, according to claim 4, wherein said visor (10) and car gutter elements (27) are integrated around an opening existing in said external structure (36) of a vehicle, including focussing means and releasable fixation means for the fixation of said housing (1) to the external structure (36) of a vehicle in cooperation with said focussing means and said releasable fixation means of the housing (1) guaranteeing a predetermined position of said opening (28) and of the visor (10) and car gutter elements (27) in relation to the window (6).

10 9.- Module, according to claim 4, wherein said visor (10) and car gutter elements (27) are part of the housing (1) itself.

10.- Module, according to claim 1, wherein said connection means with the exterior, for the supply and/or for bidirectional signal exchange, are linked to an exterior multiple connector (3).

15 11.- Module, according to claim 10, wherein said exterior multiple connector (3) is incorporated into housing (1).

12.- Module, according to claim 10, wherein said exterior multiple connector (3) is disposed at the end of a multicore wiring (2).

13.- Module, according to claim 12, wherein said multicore wiring (2) has the  
20 form of a flat tape.

14.- Module, according to claim 12, wherein said multicore wiring (2) is a printed flexible circuit.

15.- Module, according to claim 1, wherein said connection means with the exterior, for the supply and/or the bidirectional signal exchange, are materialized in the  
25 form of an emitter/receptor of electromagnetic waves.

16.- Module, according to claim 15, wherein said emitter/receptor of electromagnetic waves is a radio signals emitter/receptor.

17.- Module, according to claim 15, wherein said emitter/receptor of electromagnetic waves is an infra-red rays signals emitter/receptor.

30 18.- Module, according to claim 1, wherein said image detector (5) is part of an integrated circuit.

19.- Module, according to claim 18, wherein said integrated circuit is an A.S.I.C.

20.- Module, according to claim 7 or 8, wherein said releasable fixation means for the fixation of the mounting adapter (18) to the exterior structure (36) of a vehicle  
35 include pressurized elastic fixation elements 29).

21.- Module, according to claim 7 or 8, wherein said releasable fixation means for the fixation of the mounting adapter (18) to the exterior structure (36) of a vehicle include form-fitting fixation configurations.

22.- Module, according to claim 7 or 8, wherein said releasable fixation means for the fixation of the mounting adapter (18) to the exterior structure (36) of a vehicle include screws (37).

23.- Module, according to claim 7 or 8, wherein said exterior structure (36) of a vehicle is an exterior rear view mirror housing of a vehicle.

24.- Module, according to claim 3, wherein said visor element (10) is in a small angle inclined outwards and upwards regarding a central vision line of the image detector (5).

25.- Module, according to claim 24, wherein said small angle is approximately in an interval between 0 and 15°.

26.- Module, according to claim 4, wherein said car gutter (27) is in a certain angle inclined outwards and downwards in respect of a central vision line of the image detector (5).

27.- Module, according to claim 26, wherein said angle is approximately in the interval between 45° and 90°.

28.- Module, according to claim 3 or 4, wherein some of the more protruding zones of the visor (10) and/or car gutter elements (27) are at a certain distance of a plan in which the window (6) is disposed not less than the window diameter (6).

29.- Module, according to claim 1, wherein said housing (1) consists of two concave halves (11, 12) with respective perimetral borders (13, 14) opposed to each other and back-to-back throughout a joint (15).

30.- Module, according to claim 29, wherein said concave halves (11, 12) are provided with respective continuous flanges extended externally and adjacent to said perimetral borders (13, 14), being an annular elastic sealing element(30) embracing both continuous flanges and covering said joint (15).

31.- Module, according to claim 30, wherein in a part of at least one of said perimetral borders (13, 14) there is a recess to provide an exit for a multicore wiring (2).

32.- Module, according to claim 31, wherein said annular elastic sealing element(30) comprises a longitudinal slit adjacent to said exit for said multicore wiring (2), through which slit the multicore wiring (2) passes.

33.- Module, according to claim 29, wherein said optical system (8) is integrated in a tubular body defining an external flange (31) and an externally screw threaded portion (32), and said support (7) comprises an appendix (16) protruding from one of

said two concave halves (11, 12) of the housing (1), including said appendix (16) an internal screw thread to which the optical system (8) is screw coupled.

34.- Module, according to claim 33, wherein at least one elastic sealing element(34) is included, compressed between said external flange (31) of the optical system body (8) and an appendix end (16).

35.- Module, according to claim 34, wherein said transparent element (35) is disposed between one end of the optical system (8) and an inner bottom wall of a cover (17) externally coupled to said appendix (16), consisting said window (6) of an opening in said inner bottom wall of said cover (17).

36.- Module, according to claim 35, wherein an electrical heater (9) is included, consisting of at least one resistance in the form of a printed ring or deposited in at least one face of a peripheral area of the transparent element (35) and connected to current supply.

37.- Module, according to claim 35, wherein said appendix (16) is cylindrical and externally screw threaded, and the cover (17) is cylindrical and internally screw threaded in order to screw couple the appendix (16).

38.- Module, according to claim 37, wherein said appendix (16) includes an axial slot (33) in the external screw thread, for, at least, the pass of a current supply cable.

39.- Module, according to claim 38, wherein said appendix (16) is integral of one of said concave halves (11, 12) of the housing (1), which are obtained by injection moulding of a high-coefficient heat conductivity material.

40.- Module, according to claim 35, wherein said cover (17) is obtained by injection moulding of a high-coefficient heat conductivity material.